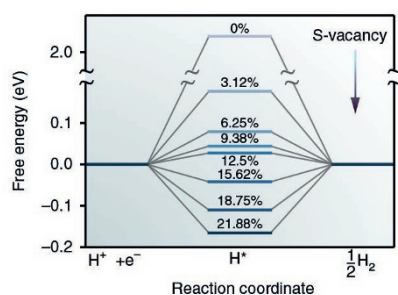


## IN BRIEF

## HETEROGENEOUS CATALYSIS

## Vacancies present catalytic opportunities



Two-dimensional transition metal dichalcogenides, such as layered molybdenum disulfide, are regarded as economically viable replacements for platinum electrocatalysts in hydrogen evolution — the cathodic reaction in electrochemical water splitting. A lot of attention has therefore focused on how to optimize these inexpensive layered materials to ensure that their catalytic activity matches or even exceeds that of platinum.

A recent *Nature Communications* article from Xiaolin Zheng, Frank Abild-Pedersen and colleagues describes a quick and scalable approach to improving the effectiveness of molybdenum disulfide for electrocatalytic hydrogen evolution. The team introduced sulfur vacancies into the material using electrochemical desulfurization, a convenient means of displacing atoms and thereby increasing the number of active sites in the material. Indeed, when sulfur vacancies are introduced into the basal plane, the material more readily produces and accommodates hydrogen atoms at its surface. These atoms subsequently join together and thus rapid evolution of dihydrogen is observed from the catalyst surface.

Adam West, Associate Editor, *Nature Communications*

**ORIGINAL ARTICLE** Tsai, C. et al. Electrochemical generation of sulfur vacancies in the basal plane of MoS<sub>2</sub> for hydrogen evolution. *Nat. Commun.* **8**, 15113 (2017)